

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

Claims 1-2 (canceled).

Claim 3 (previously presented): A video display apparatus comprising:
a horizontal deflection circuit for deflecting an electron beam back and forth in the horizontal direction to form forward and backward scanning lines in the horizontal direction on a screen;

a vertical deflection circuit for deflecting said electron beam in the vertical direction; and
a vertical velocity modulation circuit for modulating the scanning speed in the vertical direction of an electron beam for successively forming scanning lines in the horizontal direction on a screen, wherein

said vertical velocity modulation circuit comprises:

a parallel scanning circuit for outputting a parallel scanning signal for making the forward and backward scanning lines formed by said horizontal deflection circuit parallel;

a movement control circuit for producing a movement control signal for controlling the movement in the vertical direction of the scanning lines such that a part of the scanning line

having a luminance which is not less than a predetermined value in a luminance change portion in the vertical direction on the basis of a luminance signal moves farther apart from a part of the adjacent scanning line having a lower luminance than said predetermined value;

a synthesizing circuit for synthesizing the parallel scanning signal outputted by said parallel scanning circuit and the movement control signal produced by said movement control circuit; and

a vertical velocity modulation coil for generating a magnetic field for modulating the scanning speed in the vertical direction of the electron beam on the basis of a signal synthesized by said synthesizing circuit.

Claim 4 (previously presented): The video display apparatus according to claim 3, wherein

said movement control circuit comprises:

a change portion detection circuit for detecting a luminance change portion in the vertical direction on the basis of the luminance signal;

a movement distance output circuit for outputting as said movement control signal the distance of movement of the scanning line on the screen in the vertical direction in the luminance change portion detected by said change portion detection circuit on the basis of the luminance signal; and

a time axis reversion circuit for reversing the time axis of the movement control signal outputted by said movement distance output circuit in backward scanning by said horizontal deflection circuit.

Claim 5 (previously presented): The video display apparatus according to claim 3, wherein

said vertical velocity modulation circuit further comprises:

a clamping circuit for clamping the movement control signal produced by said movement control circuit to a predetermined potential at predetermined timing.

Claim 6 (previously presented): The video display apparatus according to claim 3, wherein

said vertical velocity modulation circuit further comprises:

an amplifier for amplifying the signal synthesized by said synthesizing circuit; and

a gain control circuit for controlling the gain of said amplifier.

Claim 7 (original): The video display apparatus according to claim 6, wherein said gain control circuit controls the gain of said amplifier on the basis of the number of the scanning lines formed on the screen by said horizontal deflection circuit.

Claim 8 (original): The video display apparatus according to claim 6, wherein said gain control circuit controls the gain of said amplifier depending on the positions of the scanning lines formed on the screen by said horizontal deflection circuit.

Claim 9 (previously presented): The video display apparatus according to claim 3, wherein said movement control circuit comprises:

a movement distance output circuit for outputting the distance of movement on the screen of a part of the scanning line to be an object as the movement control signal on the basis of the difference between the luminance of a part of the scanning line a predetermined number of horizontal scanning periods ahead of and the luminance of a part of the scanning line the predetermined number of horizontal scanning periods behind the part of the scanning line to be the object and the level of the luminance of the part of the scanning line to be the object such that a part of the scanning line having a luminance which is not less than a predetermined value in a luminance change portion in the vertical direction moves farther apart from a part of the adjacent scanning line having a lower luminance than said predetermined value; and

a vertical velocity modulation coil for generating a magnetic field for modulating the scanning speed in the vertical direction of the electron beam on the basis of the movement control signal outputted from said movement distance output circuit.

Claim 10 (previously presented): The video display apparatus according to claim 9, wherein

said movement distance output circuit comprises:

a difference calculation circuit for calculating the difference between the luminance of the part of the scanning line the predetermined number of horizontal scanning periods ahead of and the luminance of the part of the scanning line the predetermined number of horizontal scanning periods behind the part of the scanning line to be the object;

a first signal output circuit for outputting a first movement distance signal on the basis of an output signal of said difference calculation circuit;

a second signal output circuit for outputting a second movement distance signal on the basis of the luminance of the part of the scanning line to be the object; and

a multiplication circuit for multiplying the first movement distance signal outputted from said first signal output circuit and the second movement distance signal outputted from said second signal output circuit together, and outputting the result of the multiplication as said movement control signal.

Claim 11 (previously presented): The video display apparatus according to claim 10, wherein

said first signal output circuit sets the value of said first movement distance signal to zero when the value of the output signal of said difference calculation circuit is smaller than a

predetermined value; and

said second signal output circuit sets the value of said second movement distance signal to zero when the luminance of the part of said scanning line to be the object is smaller than the predetermined value.

Claim 12 (original): The video display apparatus according to claim 9, wherein the scanning line said predetermined number of horizontal scanning periods ahead of the part of the scanning line to be the object is the scanning line two horizontal scanning periods ahead of the part of the scanning line to be the object, and the scanning line said predetermined number of horizontal scanning periods behind the part of the scanning line to be the object is the scanning line two horizontal scanning periods behind the part of the scanning line to be the object.

Claim 13 (original): The video display apparatus according to claim 9, wherein the scanning line said predetermined number of horizontal scanning periods ahead of the part of the scanning line to be the object is the scanning line one horizontal scanning period ahead of the part of the scanning line to be the object, and the scanning line said predetermined number of horizontal scanning periods behind the part of the scanning line to be the object is the scanning line one horizontal scanning period behind the part of the scanning line to be the object.

Claim 14 (previously presented): The video display apparatus according to claim 9,
wherein

said vertical velocity modulation circuit further comprises:

a movement distance limitation circuit for limiting the distance of movement on the screen of the part of the scanning line such that the positions of the adjacent scanning lines are not replaced with each other by the movement of the part of the scanning line.

Claim 15 (original): The video display apparatus according to claim 14, wherein
said movement distance limitation circuit limits the movement control signal outputted from said movement distance output circuit to half when the luminance of the part of the scanning line to be the object and the luminance of the part of the scanning line two horizontal scanning periods behind the part of the scanning line to be the object are not less than the predetermined value, and the luminance of the part of the scanning line two horizontal scanning periods ahead of, the luminance of the part of the scanning line three horizontal scanning periods ahead of, and the luminance of the part of the scanning line three horizontal scanning periods behind the part of said scanning line to be the object are less than the predetermined value, or when the luminance of the part of the scanning line to be the object and the luminance of the part of the scanning line two horizontal scanning periods ahead of the part of said scanning line to be the object are not less than the predetermined value, and the luminance of the part of the scanning line two horizontal scanning periods behind, the luminance of the part of the scanning

line three horizontal scanning periods behind, and the luminance of the part of the scanning line three horizontal scanning periods ahead of the part of said scanning line to be the object are less than the predetermined value.

Claim 16 (previously presented): The video display apparatus according to claim 3, further comprising:

- a cathode ray tube; and
- an electron gun provided in said cathode ray tube and having a metal case,

wherein a vertical velocity modulation coil is disposed in a position departing from the periphery of said metal case of said electron gun and around said cathode ray tube for generating a magnetic field for modulating the scanning speed in the vertical direction of the electron beam on the basis of said movement control signal produced by said movement control circuit.

Claim 17 (original): The video display apparatus according to claim 16, further comprising a deflection yoke disposed in the position departing from the periphery of said metal case of said electron gun and around said cathode ray tube, and constituting said horizontal deflection circuit and said vertical deflection circuit,

said vertical velocity modulation coil being arranged inside said deflection yoke.

Claim 18 (currently amended): A video display apparatus comprising:

a horizontal deflection circuit for deflecting an electron beam in the horizontal direction to form scanning lines in the horizontal direction on a screen;

a vertical deflection circuit for deflecting said electron beam in the vertical direction; and

a vertical velocity modulation circuit for modulating the scanning speed in the vertical direction of the electron beam such that a part of the scanning line having a luminance which is not less than a predetermined value in a luminance change portion in the vertical direction moves farther apart from a part of the adjacent scanning line having a lower luminance than said predetermined value, wherein

said vertical velocity modulation circuit comprises:

a movement control circuit for producing the movement control signal for controlling the movement in the vertical direction of the scanning lines on the basis of the luminance signal;

a frequency domain emphasis circuit for emphasizing a predetermined portion of a frequency domain of said movement control signal produced by said movement control circuit; and

a vertical velocity modulation coil for generating a magnetic field for modulating the scanning speed in the vertical direction of the electron beam on the basis of said movement control signal emphasized by said frequency domain emphasis circuit, wherein

said frequency domain emphasis circuit comprises:

an extraction circuit for extracting said predetermined frequency domain of said movement control signal produced by said movement control circuit;

an adjuster for adjusting the signal in said frequency domain extracted by said extraction circuit; and

an adder for adding said movement control signal produced by said movement control circuit and the signal in said frequency domain adjusted by said adjuster together.

Claims 19-20 (canceled).

Claim 21 (previously presented): A vertical velocity modulation apparatus for modulating the scanning speed in the vertical direction of an electron beam for successively forming scanning lines in the horizontal direction on a screen, comprising:

a movement control circuit for producing a movement control signal for controlling the movement in the vertical direction of the scanning lines such that a part of the scanning line having a luminance which is not less than a predetermined value in a luminance change portion in the vertical direction on the basis of a luminance signal moves farther apart from a part of the adjacent scanning line having a lower luminance than said predetermined value; and

a vertical velocity modulation coil for generating a magnetic field for modulating the scanning speed in the vertical direction of the electron beam on the basis of the movement control signal produced by said movement control circuit;

a parallel scanning circuit for outputting a parallel scanning signal for making forward and backward scanning lines formed on the screen by deflecting the electron beam back and forth parallel; and

a synthesizing circuit for synthesizing the movement control signal produced by said movement control circuit and the parallel scanning signal outputted by said parallel scanning circuit,

said vertical velocity modulation coil generating a magnetic field for modulating the scanning speed in the vertical direction of the electron beam on the basis of a signal synthesized by said synthesizing circuit.

Claim 22 (previously presented): The vertical velocity modulation apparatus according to claim 21, wherein

said movement control circuit outputs the distance of movement on the screen of a part of the scanning line to be an object as said movement control signal on the basis of the difference between the luminance of a part of the scanning line a predetermined number of horizontal scanning periods ahead of the luminance of a part of the scanning line the predetermined number of horizontal scanning periods behind the part of the scanning line to be the object and the level of the luminance of the part of the scanning line to be the object.

Claim 23 (currently amended): A vertical velocity modulation apparatus for modulating the scanning speed in the vertical direction of an electron beam for successively forming scanning lines in the horizontal direction on a screen, comprising:

a movement control circuit for producing a movement control signal for controlling the movement in the vertical direction of the scanning lines such that a part of the scanning line having a luminance which is not less than a predetermined value in a luminance change portion in the vertical direction on the basis of a luminance signal moves farther apart from a part of the adjacent scanning line having a lower luminance than said predetermined value;

a vertical velocity modulation coil for generating a magnetic field for modulating the scanning speed in the vertical direction of the electron beam on the basis of the movement control signal produced by said movement control circuit; and

a frequency domain emphasis circuit for emphasizing a predetermined portion of a frequency domain of said movement control signal produced by said movement control circuit, wherein

said frequency domain emphasis circuit comprises:

an extraction circuit for extracting said predetermined frequency domain of said movement control signal produced by said movement control circuit,

an adjuster for adjusting the signal in said frequency domain extracted by said extraction circuit; and

an adder for adding said movement control signal produced by said movement control circuit and the signal in said frequency domain adjusted by said adjuster together.

Claims 24-26 (canceled).

Claim 27 (previously presented): A video display method comprising the steps of:
deflecting an electron beam back and forth in the horizontal direction and the vertical direction, to successively form forward and backward scanning lines in the horizontal direction on a screen; and

modulating the scanning speed in the vertical direction of the electron beam for successively forming scanning lines in the horizontal direction on a screen, wherein

the step of modulating said scanning speed comprises the steps of:

outputting a parallel scanning signal for making the forward and backward scanning lines parallel;

producing a movement control signal for controlling the movement in the vertical direction of the scanning lines such that a part of the scanning line having a luminance which is not less than a predetermined value in a luminance change portion in the vertical direction on the basis of a luminance signal moves farther apart from a part of the adjacent scanning line having a lower luminance than said predetermined value;

synthesizing said parallel scanning signal and said movement control signal; and

generating a magnetic field for modulating the scanning speed in the vertical direction of the electron beam on the basis of a synthesized signal.

Claim 28 (previously presented): The video display method according to claim 27 wherein

the step of producing said movement control signal comprises the steps of:
detecting the luminance change portion in the vertical direction on the basis of the luminance signal;
outputting the distance of movement of the scanning line on the screen in the vertical direction in said luminance change portion as said movement control signal on the basis of the luminance signal; and
reversing the time axis of said movement control signal in said backward scanning.

Claim 29 (previously presented): The video display method according to claim 27, wherein

the step of modulating said scanning speed comprises the step of:
clamping said movement control signal to a predetermined potential at predetermined timing.

Claim 30 (previously presented): The video display method according to claim 27,
wherein

the step of modulating said scanning speed further comprises the step of:

setting the distance of movement on the screen of the part of said scanning line to be the object on the basis of the difference between the luminance of the part of the scanning line the predetermined number of horizontal scanning periods ahead of and the luminance of the part of the scanning line the predetermined number of horizontal scanning periods behind the part of the scanning line to be the object and the level of the luminance of the part of the scanning line to be the object.

Claim 31 (currently amended): A video display method comprising the steps of:

deflecting an electron beam in the horizontal direction and the vertical direction, to successively form scanning lines in the horizontal direction on a screen; and

modulating the scanning speed in the vertical direction of the electron beam such that a part of the scanning line having a luminance which is not less than a predetermined value in a luminance change portion in the vertical direction moves farther apart from a part of the adjacent scanning line having a lower luminance than said predetermined value, wherein

the step of modulating said scanning speed comprises the steps of:

producing a movement control signal for controlling the movement in the vertical direction of the scanning lines on the basis of the luminance signal;

emphasizing a predetermined portion of a frequency domain of said movement control signal; and

generating a magnetic field for modulating the scanning speed in the vertical direction of the electron beam on the basis of said movement control signal, wherein

said step of emphasizing includes the steps of:

extracting said predetermined frequency domain of said produced movement control signal;

adjusting the signal in said extracted frequency domain; and

adding said produced movement control signal and the adjusted signal in said frequency domain together.